

MAINTENANCE DECISION SUPPORT SYSTEM (MDSS): PHASE 3

By: Lindsey Costello

PROBLEM

At present, NDOT is working with the University of Nevada, Reno to develop data telemetry using cellular modems as well as Nevada's statewide Enhanced Digital Access Communications System (EDACS) to gather data in real-time from NDOT vehicles (plows, crew vehicles, etc.). These systems use the data gathered from mobile vehicles to make forecasts and recommendations that help reduce maintenance costs and improve level of service.

OBJECTIVE

This project seeks to address the final obstacles to implementing an MDSS system in Nevada. The ability to collect mobile observations has the potential to greatly enhance weather and road condition forecasts, which have historically been of poor quality in Nevada due to the various microclimates. No other DOTs use multi-modal vehicle telemetry with a combination of radio and cellular data. This is because most other states have extensive cellular coverage, making radio network-based telemetry unnecessary. Nevada is an exception to this, making systems like this essential.

Key Points:

Project Number:

450-15-803

Start Date:

September 1, 2015

Duration:

24 Months

Project Cost:

\$200,016

Associate Professor,

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Eric L. Wang

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METHODOLOGY

	Task / Objective	Outcome
1	Tracking Sand and liquid chemical deicing material usage	Presentation and analysis of field test results (from a winter season) from the IMO vehicles installed with material tracking sensors.
2	Develop and deploy MMS data Display capability	A web-based interactive map interface that displays material application rate as a function of vehicle location.
3	Studying the accuracy of weather and road condition forecasts	A report on forecast accuracy that compares forecast road and weather data (e.g. road and air temperatures) from NDOT's current provider to mobile observations.
4	Study and develop technology for mobile freeze point and/or salinity sensors	A report and/or professional manuscript describing the methodology for non-contact assessment of salinity and melting temperature of road surfaces.

IMPLEMENTATION POTENTIAL

This effort is presently in Stage 3/4 (Field Demonstration/Pilot), using ~40 vehicles in Northern Nevada. Nevada can expect to see substantial savings if they choose to implement MDSS. Other DOTs have reported a reduction in their use of salt/sand by 20-40% as well as associated labor cost savings. Using a conservative estimate of 20%, Nevada would still save over \$530,000 annually based on the current salt/sand budget of about \$2.6 million.

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